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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,136	12/01/2003	Axel Buerke	INF-118	1208

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EXAMINER	
VU, HUNG K	

ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 06/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/724,136	BUERKE ET AL.	
	Examiner	Art Unit	
	Hung Vu	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 April 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7 and 16-28* is/are pending in the application.

4a) Of the above claim(s) *4* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-7 and 16-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Embodiment of Figure 1A, claims 1-7 and 16-28, in the reply filed on 04/08/05 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Applicant's election without traverse of Embodiment of Figure 1A, claims 1-7 and 16-28, in the reply filed on 04/08/05 is acknowledged.

2. However, claim 4, which is not belong to the elected embodiment, is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 04/08/05.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Akram et al. (PN 6,271,590, of record).

Akram et al. discloses, as shown in Figures 5 and 6, a microelectronic component comprising one barrier layer (50a, 50b or 50c) formed from WN_x, where x is selected as a value between 0.3

and 0.5 [Col. 4, lines 1-36. Note that Adram et al. teaches layer 50 may be made of a number of discrete sub-layers, for example, 50a, 50b, and 50c, which have a particular composition varies from 0.25% to 99.5% (including the value between 0.3 and 0.5)].

Regarding claim 2, Akram et al. discloses the component further comprising a first layer (52) made of a conductive material adjoining at least one side of the barrier layer formed from WN_x.

4. Claims 1-2, 16-20 and 22-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Nagabushnam et al. (PN 5,888,588).

Nagabushnam et al. discloses, as shown in Figure 7, a microelectronic component comprising one barrier layer (21) formed from WN_x, where x is selected as a value between 0.18 and 0.5 which including the value of between 0.3 and 0.5 [Col. 3, lines 5-19].

Regarding claim 2, Nagabushnam et al. discloses the component further comprising a first layer (52) made of a conductive material adjoining at least one side of the barrier layer formed from WN_x.

Regarding claim 16, Nagabushnam et al. discloses, as shown in Figure 7, a microelectronic component comprising:

a first region (16), the first region comprising a material (silicon) other than WN;

a barrier layer (21) overlying and physically touching the first region, the barrier layer comprising a uniform composition layer of WN_x, where x is a substantially constant value between 0.18 and .50 (within the range of 0.3 and 0.5) [Col. 3, line 5-19];

a material layer (22) overlying and physically touching the barrier layer, wherein the material layer comprises material other than WN.

Regarding claim 17, Nagabushnam et al. discloses the first region comprises a conductor.

Regarding claim 18, Nagabushnam et al. discloses the first region comprises polysilicon.

Regarding claim 19, Nagabushnam et al. discloses the material layer comprises an electrically conductive material.

Regarding claim 20, Nagabushnam et al. discloses the material layer comprises tungsten.

Regarding claim 22, Nagabushnam et al. discloses the first region comprises silicon.

Regarding claim 23, Nagabushnam et al. discloses the material layer comprises polysilicon.

Regarding claim 24, Nagabushnam et al. discloses, as shown in Figure 7, a transistor comprising:

a semiconductor body (12);

a source (72) disposed in the semiconductor body;

a drain (72) disposed in the semiconductor body and spaced from the source by a channel;

a gate dielectric (14) overlying the channel;

a barrier layer (21) overlying the gate dielectric; the barrier layer comprising a single layer of WN_x, wherein x is a constant value between 0.18 and .50 (within the range of 0.3 and 0.5) [Col. 3, line 5-19];

a gate conductor (22) overlying the barrier layer.

Regarding claim 25, Nagabushnam et al. discloses the transistor further comprising a polysilicon layer (16) between the gate dielectric and the barrier layer.

Regarding claim 26, Nagabushnam et al. discloses the gate conductor comprises tungsten.

Regarding claim 27, Nagabushnam et al. discloses the barrier layer physically touches the polysilicon layer and also physically touches the gate conductor.

Regarding claim 28, Nagabushnam et al. discloses the barrier layer has a thickness in the range of 5 to 12 nm (within the range of 1 to 50 nm) [Col. 3, line 5-19].

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3, 5-7 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagabushnam et al. (PN 5,888,588).

Regarding claims 3 and 21, Nagabushnam et al. discloses the component further comprising a second layer made of a conductive material adjoining the side of the barrier layer formed from WN_x, opposite to the first layer made of the conductive material. Nagabushnam et al. does not disclose the first layer and the second layer are comprised of the same conductive material or the first region comprises a tungsten region and the material layer comprises a tungsten layer. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the first layer and the second layer of Nagabushnam et al. comprised of the same conductive material or the first region and the material layer of Nagabushnam et al. comprises a tungsten region and a tungsten layer, respectively, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Regarding claim 5, Nagabushnam et al. discloses the component further comprising a layer stack that is constructed from at least the first layer made of the conductive material,

The barrier layer formed from WN_x and the second layer made of the conductive material forming a gate electrode of a transistor.

Regarding claim 6, Nagabushnam et al. discloses at least one of the first layer and the second layer is constructed from tungsten.

Regarding claim 7, Nagabushnam et al. discloses at least one of the first layer and the second layer being constructed from polysilicon.

Response to Arguments

6. Applicant's arguments filed 12/13/04 have been fully considered but they are not persuasive.

It is argued, at page 6 of the Remarks, that Akram et al. does not disclose one barrier layer WNx, where x is selected in one barrier layer as a specific value between 0.3 and 0.5. This argument is not convincing because Akram et al. discloses, at Col. 4, lines 1-19, that the graded layer may be made of a number of discrete sub-layers, 50a, 50b and 50c. Akram et al. further discloses that each sub-layers 50a, 50b and 50c may have a particular composition. Therefore, it is inherent that one of sub-layers 50a, 50b or 50c may have a value x that is between 0.3 and 0.5.

7. Applicant's arguments with respect to claims 1, 16 and 24 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung K. Vu whose telephone number is (571) 272-1666. The examiner can normally be reached on Mon-Thurs 6:00-3:30, alternate Friday 7:00-3:30, Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (571) 272-1732. The Central Fax Number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Vu

June 23, 2005

Hung Vu

Primary Examiner